

THE NAVY & MARINE CORPS AVIATION SAFETY MAGAZINE

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Approach

The Heat is On



*Safety Award Winners
for 2009*

IT'S SUMMER AND THE HEAT IS ON. IN THE AIR OR ON THE GROUND,
TAKE THE PROPER STEPS TO BEAT THE HEAT AND GET THE
JOB DONE. OUR DOCS HAVE SEVERAL TIPS TO KEEP YOU PHYSICALLY READY.



The Navy & Marine Corps Aviation Safety Magazine

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Mishaps cost time and resources. They take our Sailors, Marines and civilian employees away from their units and workplaces and put them in hospitals, wheelchairs and coffins. Mishaps ruin equipment and weapons. They diminish our readiness. This magazine's goal is to help make sure that personnel can devote their time and energy to the mission. We believe there is only one way to do any task: the way that follows the rules and takes precautions against hazards. Combat is hazardous; the time to learn to do a job right is before combat starts.

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The Initial Approach Fix

Welcome Aboard

"A smoking hole is a small price to pay for a SH maneuver."

"Every approach is salvageable."

"I'd rather die than look bad."

"I didn't get to 5,200 hours by being safe."



How many times have I jokingly said the aforementioned diatribes? Fortunately, these wistful statements never reached fruition and hopefully, no listeners took me seriously. Now, I've been given the honor of being the man at the helm of our Naval Aviation Safety Programs, and the chance to serve with an extremely hardworking group of aviation and other safety professionals. It has been interesting so far to say the least. If this job ever becomes routine then I need to reevaluate what I'm doing. After only a short time onboard the Safety Center, I've already received several phone calls no one ever wants to get. I still can't get used to hearing, "Sir, we've had a mishap. Here's what we know so far... "

We always talk about the AMB and investigators finding the causal factors to a mishap, sometimes likened to peeling back the onion skins, and getting to the source. Standing over that smoking hole or sifting through wreckage may provide some answers as to why a mishap occurred, but we have to get our safety brains engaged before, not after the event.

The Naval Safety Center has many programs and resources in place and safety professionals to lend 24/7 support as we work toward zero mishaps. To achieve this, everyone in aviation has to adopt and live a safety mindset in everything we do. Whether it's the aircrewman conducting a preflight, the pilot doing mission prep, the maintainer doing a daily, or just driving your car or motorcycle, everyone works toward the same goal: mission success. A major component of that success is taking care of ourselves and our shipmates.

Our Aviation Safety Directorate is working on the final review and eventual implementation of an updated Operational Risk Management instruction, continuing the extremely important and timely aircrew fatigue studies, aggressively tracking WESS reported hazreps, developing the WESS Aviation module for mishap reporting, and keeping our finger on the pulse of all matters aeronautical.

We are on track for 2010 to be one of our safest aviation years ever. We can do this, but it has to be a team effort. All the posters, magazine articles and intrusive leadership will be for naught, if our pilots, naval flight officers, aircrew and maintainers fail to adhere to the time-tested principles of ORM and, more importantly, practice common sense decision making. Keep the shiny side up and watch out for each other.

Z-man sends.

Capt. Mike Zamesnik
Director Aviation Safety Programs

Aviation Safety Award Winners for 2009

Command Excellence Through Safety

The Chief of Naval Operations and the Commander Naval Safety Center are proud to announce the winners of the CNO Aviation-Related Safety Awards for CY 2009.

CNO Aviation Safety Award

These award winners are recognized for their professionalism, commitment to excellence, solid leadership and competent risk management which resulted in safe and effective operations.

COMMARFORPAC

HMLA/T-303 HMLA-369
HMM(T)-164 HMM-265
HMM-268 VMGR-152
VMGR-352 HMH-362
HMH-363 HMH-463
HMH-466 VMA-311
VMFA(AW)-225

COMMARFORCOM

VMGR-252 VMM-266
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VMA-542 VMFA-312
VMR-1 VMAQ-1

COMNAVAIRFORES

VP-69 ETD PAC
VR-55 VR-61
VR-57 HSL-60
VFC-111 VFC-12

CNATRA

VT-2 VT-4
VT-7 VT-22
VT-27 VT-31
HT-18

CG FOURTH MAW

HMLA-773 HMH-772
VMGR-452 VMGR-234
VMR Det. Andrews

COMNAVAIRLANT

VFA-131 VFA-143
VAW-124 HS-7
HSL-46 HSC-28
VP-45 VX-1

COMNAVAIRSYSCOM

VX-30
FRC Southeast

COMNAVAIRFOR

VFA-195 VFA-14 VAW-117 HSC-8
HSL-49 HSC-23 VP-46 VQ-2 (EW)
VAQ-139 (PAC DEPLOYED) VQ-3 (TACAMO)
VAQ-134 (EXPEDITIONARY) VAQ-140 (LANT DEPLOYED)

Naval Aviation Readiness Through Safety Award and the Adm. James S. Russell Naval Aviation Flight Safety Award

Presented annually to the controlling custodian that has contributed the most toward readiness and economy of operations through safety. The command selected must have an outstanding safety record, an aggressive safety program, and an improving three-year safety trend.

Winner: Commanding General Fourth Marine Aircraft Wing

Admiral Flatley Memorial Award

To recognize the CV/CVN and LHA/LHD ships with embarked CVW or MAGTF, which surpass all competitors in overall contributions to safety. These teams are selected based on operational readiness and excellence, and an exceptional safety program and record.

Winners: USS *Dwight D. Eisenhower* (CVN-69) and CVW-7

USS *Bataan* (LHD-5) and 22ND MEU

Runners-up: USS *George Washington* (CVN-73) and CVW-5

USS *Boxer* (LHD-4) and 13TH MEU

Grampaw Pettibone Award

Presented annually to the individual and unit that contributes the most toward aviation safety awareness through publications and media resources.

Unit awards:

Winner: HSL-49

Runner-up: HSC-26

Individual awards:

Winner: Lt. David Scott Cohick, VT-4

Runner-up: Ltjg. Danielle Woods, HSC-26

Media award:

Winner: VT-10 (https://www.cnatra.navy.mil/tw6/vt10/safety_publications.asp)



Dehydration, Heat Stress In-Flight?

Not Me!

Dehydration Hazrep

A T-39 naval flight student completed 30 minutes of intense aerobic exercise the night before a flight. Following her exercise session, she ate a six-inch sandwich and drank eight ounces of water at 2000. She went to bed at 0230, woke up at 0700 and had an eight-ounce serving of yogurt for breakfast at 0800. At 1100, she ate another eight-ounce yogurt and drank 10 ounces of iced tea. The preflight brief was at 1230 for a 1430 takeoff. During the flight, at about 1530, she had hot flashes and felt disoriented. A few moments later, the aircraft banked as she looked out the cockpit. She immediately felt worse, and told the MC she felt like passing out. The MC called a knock-it-off and RTB.

During the flight home, her symptoms didn't get any better, and she had difficulty communicating with fellow aircrew. Once the aircraft landed she was seen by a flight surgeon. The lab results indicated she had urinary ketones, which are normal by-products of breaking down fat for energy. The presence of ketones in the urine was due to inadequate caloric intake. This resulted in her inability to maintain an optimal blood-sugar level, and is significant for two reasons. First, the brain's primary source of energy is sugar, and an inadequate intake will cause a decline in mental performance and eventually incapacitation. Second, about 30 percent of the average person's fluid intake comes from food. The combination of low caloric intake, low fluid intake, and intense aerobic exercise contributed to dehydration.

Heat Stress Hazrep

During an FA-18 flight, the cabin-flow valve, which regulates the environment-control-system (ECS) flow to the cockpit, was found stuck open. This reduced airflow to the avionics and triggered the AV AIR HOT caution. Once the ECS was secured using AV AIR HOT procedures, the lack of cabin airflow, combined with a high OAT/heat index and the greenhouse affect of the bubble canopy, resulted in an estimated cockpit temperature of more than 130 F.

This incident underlines how important it is that aircrew recognize heat-related illness. The immediate recognition of symptoms directly contributed to their expeditious recovery and minimized aircrew exposure to a dangerous environment. Because of frequent operations in unusually warm and humid environments, all aircrew should make themselves as familiar with the symptoms of heat-related illness as they are with hypoxia.



BY CDR. DON DELOREY

W

hat do these hazreps illustrate? They show the effects of dehydration and heat stress on the aviator in the flight environment.

The main component of the human body is water: about two-thirds of your body weight is water, which means an individual who weighs 170 pounds will have more than 10 gallons of water in their cells, around the cells and in the bloodstream. Clearly, water has an important role in the body.

While many pilots are aware of the term “dehydration,” very few take appropriate actions to make sure they are well hydrated before, during and after flight operations. Why is this? It appears that most pilots are unaware of the symptoms and devastating effects associated with dehydration, which can increase the risk of a mishap, even during a mildly warm day.

What causes dehydration? It can be caused by many factors, such as inadequate fluid intake, a dry environment in the aircraft, excess caffeine and antihistamines. Hot cockpits and flight lines also can cause dehydration. A blistering hot 130-degree ramp at Yuma, Ariz., is an obvious cause of dehydration. However, what about the less obvious cause: the 72-degree cockpit? The average humidity in the cockpit is quite low, which can result in a substantial amount of lost fluid.

Dehydration and performance

Dehydration can result in decrements in physical and cognitive performance. Each of these can occur when two percent or more of body weight is lost because of unreplaced water or water restriction, heat,

and/or physical exertion. Long-term effects of dehydration can include wrinkled skin, impaired memory function, dry hair, brittle nails, constipation, and susceptibility to colds and sinus infections (because of extremely dry nasal passages).

Common signs of dehydration are headache, fatigue, cramps, sleepiness, and dizziness. You must be aware that unreplaced water losses of two percent of your body weight will degrade your ability to regulate heat. At three percent loss, there is a decrease in muscle cell contraction times. When fluid losses equal four percent of body weight, you'll have a five-to-10 percent drop in overall performance, which can last up to four hours.

Another physiological factor that can be associated with dehydration is heat exhaustion, which consists of the following three stages. The transition from one stage to the next can be very evident, hardly noticeable, or not evident at all.

Heat stress (body temperature, 99.5 to 100 F) reduces:

- Performance, dexterity, and coordination
- Ability to make quick decisions
- Alertness
- Visual capabilities
- Caution and caring

Heat exhaustion (101 to 105 F) symptoms are:

- Fatigue
- Nausea/vomiting
- Giddiness
- Cramps
- Rapid breathing
- Fainting

Heat stroke (>105 F) symptoms are:

- Body's heat control mechanism stops working
- Mental confusion
- Disorientation
- Bizarre behavior
- Coma

Preventing dehydration

You should drink two to four quarts of water every 24 hours. However, as each person is physiologically unique, this should be used only as a guide. You also can apply the eight-cups-a-day rule, with each cup of water being about eight ounces. By drinking eight cups of water a day, you'll consume 64 ounces (two quarts).

It also is important to monitor your hydration status. Most people will become thirsty when they have a one-and-a-half-quart deficit (about a loss of about two percent of total body weight), which will trigger the thirst mechanism. You might believe the thirst mechanism is the proper cue to drink more water; however, the thirst mechanism arrives too late and too easily is

turned off. A small amount of fluid in the mouth can turn off the thirst mechanism, which will further delay the replacement of body fluids.

Remember that the environmental temperature and humidity, as well as personal lifestyle and individual physiology, will influence the amount of water you need to prevent dehydration. If you do not maintain good situational awareness (SA) of your water requirements by knowing your flight environment and personal physiological status, you can progress to heat exhaustion.

To help prevent heat exhaustion.

- *Drink cool water.*

Don't rely on the thirst sensation as an alarm; stay hydrated throughout the day.

Limit excessive intake of caffeine and alcohol beverages.

Hydrate before, during, and after exercise, as exercise can result in large amounts of body fluid loss.

Note that acclimation to a major change in weather takes about one to two weeks.

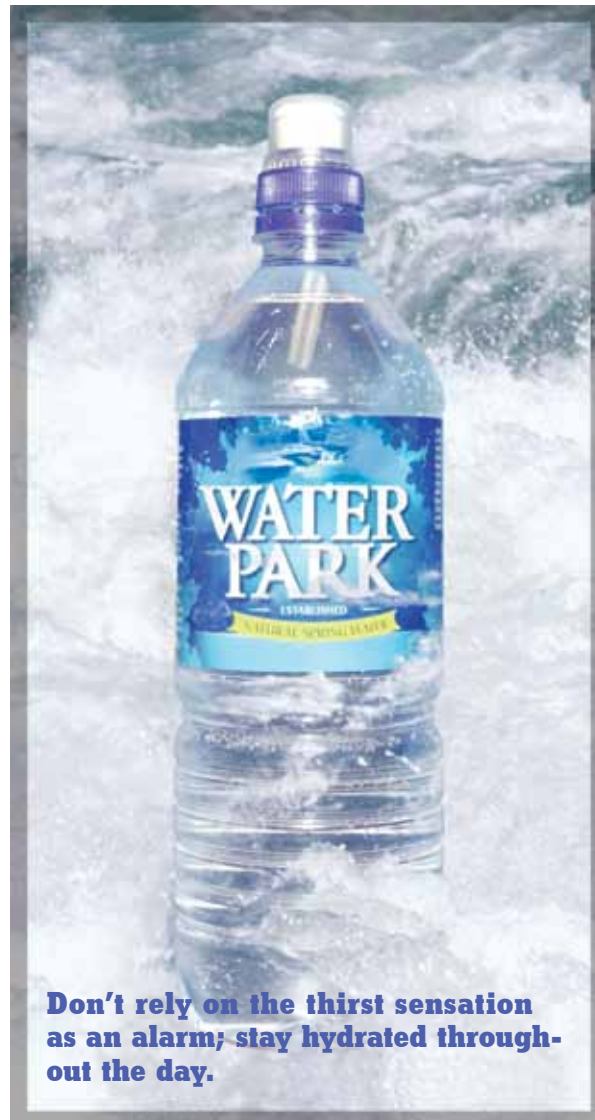
Monitor personal effects of aging, recent illness, diarrhea, or vomiting.

Monitor your work and recreational activity; if you feel lightheaded or dizzy, call it a day.

For the average person with a moderate exercise program, the loss of salt and electrolytes in extreme heat and exercise conditions is usually not a factor, as the typical American diet takes care of the loss.

Bottom line, remember to hydrate—your body will thank you. 🦅

CDR. DELOREY IS THE AEROSPACE PHYSIOLOGIST
AT THE NAVAL SAFETY CENTER.



Don't rely on the thirst sensation as an alarm; stay hydrated throughout the day.

Run or Fly?

BY LCDR. BRAD SPARKS

Not all mishaps occur in the plane. The things we do off duty can affect mission readiness as much as our actions in the aircraft. Unfortunately for me, I did one of those things.

I just had wrapped up a 4.5-hour cycle in the mighty Hawkeye, looking for drug smugglers headed to North America. I envisioned a beautiful fall, cool early afternoon, however, my Central America reality was 90 F with 90-percent humidity. Our fitness assessment was fast approaching, and waiting until the evening to run was not an option: forward-operating-location (FOL) rules prohibited it. However, the incessant heat warnings did not apply to me because I lived in Central Florida, and I was acclimated to this kind of weather.

I carefully ORM'd the situation, and decided to wait until 1600 to hit the pavement. After some mild stretching and downing a bottle of water, I hit the bricks. I maintained a medium pace, running on the road from the FOL main building to the inner gate. It certainly was hot. I could feel the heat coming from the asphalt through my shoes, and I felt little to no wind. I loved it when a car would come by and generate some breeze. I kept going because I always finish what I start; I am not a quitter.

Did I finish? You bet I did. I made my goal and crossed that line. Granted, I was profusely sweating, and my heart was really pumping, but I felt OK and was

still alive. What does not kill you makes you stronger, right? I drank a lot of water, cooled down with the air conditioning blowing on me and stretched. After all, I was smart about this.

Back in my room, I took a cold shower. I was sore from the run, and was starting to feel worn out. My early wakeup, the flight, and my afternoon jog had caught up to me. A nap on the couch sounded like a great idea. When I arose from my slumber, I had a fierce headache, chills and hot flashes, and I still was sweating. I was too young and the wrong gender to be going through menopause. I drank more water and self-medicated (aspirin) before laying down for another nap.

A few hours later, I didn't feel any better, but was hungry. At the restaurant, it was apparent to the rest of the wardroom that I was struggling. Obviously, I looked as bad as I felt. I mentioned I felt like I had a hangover, but otherwise was surviving. I felt nauseous, so got my food to go. I barely made it back to my room before vomiting. My flight surgeon stopped by my room to check on me because he had seen me at dinner. He actually thought I might be having a heart attack.

My doc determined I had heat exhaustion. My prescription was large amounts of water, and rest. I was pulled from the flight schedule for the following day. My squadron replaced me on the schedule, but my situation could have really had a negative impact on our mission readiness.

While running in the heat inherently was a risky proposition, I thought I had mitigated all the risks. I already was acclimated to the weather, I had stretched, and most importantly, I hydrated before and after my run. Yet, it was not enough. I will not be running during the heat of the day again. 🦅



LCDR. SPARKS FLIES WITH VAW-77.

Heating Up

The Wet-Bulb Globe Temperature Index (WBGTI) takes into account four variables: air temperature, humidity, radiant heat and air movement. This reading gives a more accurate measurement of heat stress than any one reading alone.

BY CAPT. NICK DAVENPORT, MC

The body can only function well and survive within a very narrow range of temperatures. This becomes a problem when we have to exercise or perform heavy manual labor, since the muscular activity and work done produce heat as a by-product. Just as a car engine straining to climb a grade can overheat, boil its radiator and seize up, humans figuratively can do the same.

Most cars dissipate heat by drawing cooler air over the radiator coils (convective heat loss) and to a much lesser extent by radiating heat (radiant heat loss) to the surrounding environment. “Radiators” should really be called “convectors” because that’s primarily how they act. We’ll call our heat loss mechanisms “heat exchangers.”

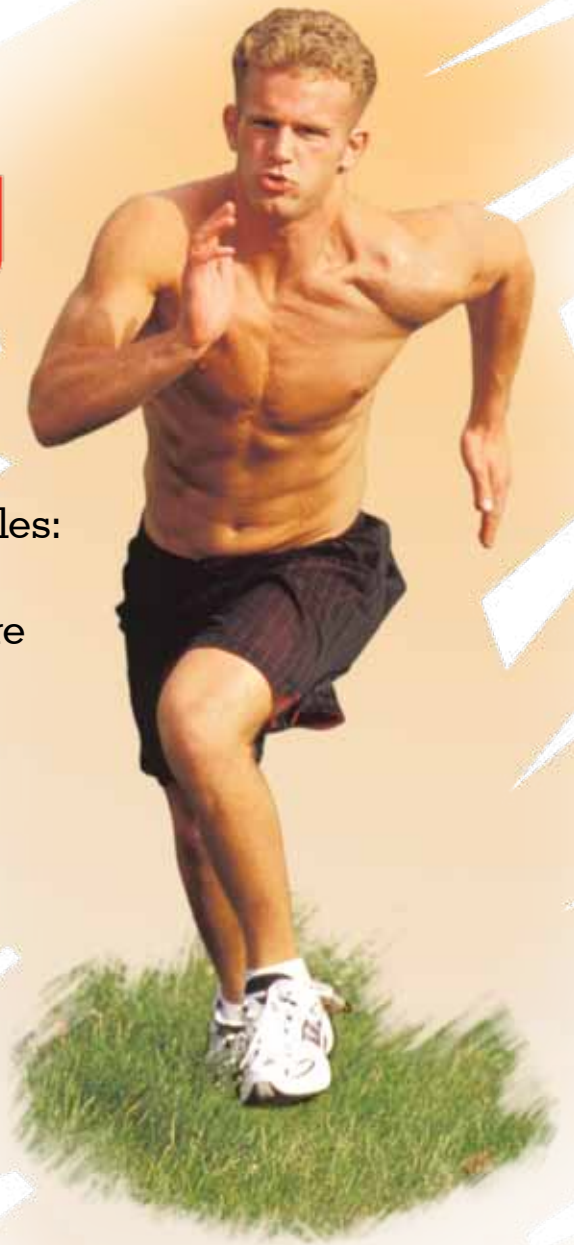
Our heat exchangers, which dissipate excess body heat, are much more sophisticated than your car’s. The lungs, bare skin, and sweat glands dissipate heat. Air drawn into the lungs is heated to body temperature and saturated with water vapor, both of which cool the air passages and lungs while the heated humidified air is exhaled (convection, followed by evaporation). Your dog has figured this out, which is why he pants with his wet tongue hanging out on a hot day.

Sweat will evaporate from the skin as long as the

humidity and ambient temperature are low enough, which is why you stand sweating in front of that fan in the gym after your workout. This is the chief method of heat exchange during exercise. But guess what, if the air temperature is 98.6 F, and the humidity is 100 percent, you’ve now lost all ability to lose heat by convection and evaporation.

You’ll notice that convection combined with evaporation depends on having plenty of water available, which is why hydration is so important when exercising in hot conditions. Because these are the primary heat exchangers in exercise, lots of water is required. Thirst may not be a reliable indicator of fluid need. That’s why monitoring the urine color is a better indicator; a pale color is best.

As long as the surrounding temperature is less than



98.6 F, the skin successfully can radiate heat. When you are in a room temperature environment and not exercising, you are experiencing the prime method of heat exchange. While standing in the sun, you're absorbing radiant heat. You're now gaining additional heat.

Conductive heat loss is possible by exposing the skin to cold surfaces. Jumping in a cold pool on a hot day causes heat loss by conduction. Cold objects applied to the skin, such as putting ice packs under the armpits and on the groin area, do the same thing. In cold water, hypothermia can develop rapidly because of the excellent heat-conducting properties of water (about 25 times greater than air).

Even with normal exercise, the body core temperature can rise a couple of degrees. We typically react by panting, sweating, and standing in front of a fan or air conditioner to cool off. When we speak of heat acclimatization, we're talking about the body getting as efficient as it can at employing these different heat exchangers. All our heat exchangers can max out when conditions of high work load combine with elevated environmental temperatures and high humidity. Relative dehydration and loss of electrolytes such as salt also can occur when working in hot climates over several days. Many health conditions (obesity, deconditioning), alcohol, hangovers, and medications (antihistamines, blood pressure medications) adversely affect our heat exchangers, making us more susceptible to heat injury. Exercising in sweat suits or heavy clothing to lose weight only results in increased dehydration and risk of heat injury.

That strange gadget, called the wet bulb globe temperature (WBGT) meter, is designed to measure the environment to see if the heat exchangers of the body can liberate enough heat during exercise. Once the WBGT gets high enough, the dreaded black flag is raised, indicating the environment can't accept the heat humans generate when exercising. It's not a motivation or a "gut it out" sort of thing, it's just plain physics. These evaporative, convective, radiative and conductive heat-exchanging mechanisms just can't keep pace with the heat generated, and body temperatures start to rise. When you exercise in black-flag conditions, you start to cook. LCdr. Sparks in his "Run or Fly" article (p. 7) provided an excellent description of what that feels like.

Heat cramps occur as fluid and electrolytes are lost from the body in hot climates while exerting the muscles. Extremity and abdominal muscles can become irritable and may go into spasm and fail to relax after contraction, causing painful cramps. Hydration, rest,


cooling, and stopping the exercise typically relieve heat cramps, but it may take two-to-three days to restore body fluid and electrolyte equilibrium. Heat cramps may not occur first, so they are unreliable as a warning sign. Most animals will sensibly stop at this point, but horses and humans can be motivated to press on.

Heat exhaustion occurs as the process continues, and the core temperature rises. The brain realizes it's starting to cook, and marshals all the body resources to get rid of the excess heat. Respiration increases and panting ensues. The heart circulates blood faster, veins and arteries dilate, and fluids are shifted from the blood into the sweat glands and membranes of the airways. The skin may be clammy, moist and pale. Nausea, vomiting and diarrhea may follow. If exercise is not stopped and hydration isn't given, heat exhaustion can progress to heat stroke.

HEAT STROKE SIGNALS THE FINAL PHASE, and begins when the brain loses its ability to regulate the body's heat exchangers. Absence of sweating and mental-status changes are key features. The individual is confused, delirious or even comatose, and can no longer assess the dire situation and react appropriately. The core temperature may be above 105 F and spiraling higher. From a combination of excessive temperature, dehydration, and metabolic byproducts, the regulatory circuits fail. As water is lost from the blood and tissues, the blood thickens and tissues become severely dehydrated. Blood is shunted away from other vital organs such as the kidney and digestive organs in the gut. Kidney failure may begin as these high-energy organs starve for blood. Muscles may break down, showering the kidneys with muscle proteins, and plugging the kidneys (rhabdomyolysis). The skin may be hot and pale.

This condition is a true medical emergency, and rapid cooling and IV hydration are required to save life. Immediately get the individual in the shade, spray with cold water, fan air over the body and apply ice. The neck, armpits and groin typically are chosen first because large arteries and veins cross these areas that are directly cooled by the ice.

Don't forget to call 911.

Bottom line, follow LCdr. Sparks' advice and don't exercise in black-flag conditions. The heat experience you have today may keep you off tomorrow's flight schedule. 

CAPT. NICK DAVENPORT IS THE HEAD, AEROMEDICAL DIVISION, NAVAL SAFETY CENTER.

Am I Really Turning?

“What just happened? Which way is up? Why is my airspeed going crazy? Am I really turning?”

BY LTJG. JESSICA PHILLIPS

About three seconds before I realized what was going on mass confusion plagued my thoughts. I had heard about this situation every year at Helicopter Instrument Ground School (HIGS) and had read articles about it. I recognized the signs; they were all straight from the book. I just didn't want to believe it actually was happening to me.

“You have the controls... I think I have vertigo,” I said.

The day had started off just like any other morning in Bahrain. The weather was typical for the summer: hazy and hotter than a hairdryer blowing on you at max blast for hours on end. I was eager to go flying and even more excited to go at night, when the temperatures actually might be below 100 degrees. The plan was to launch a flight of two MH-60S to conduct tactical-formation (TACFORM) training, so that two of our aircrewmembers could complete a syllabus card. The other copilot and myself had completed our night TACFORM cards, so we were confident that we could execute the flight as planned.

Looking back, we should have seen the holes in the Swiss cheese lining up from the beginning. If launching into the haze that surrounds the Northern Arabian Gulf (NAG) on a zero-percent-illumination night sounds like a bad idea, adding a second aircraft into the equation does not make it any better. Still, we felt confident we could make the best of a less-than-desirable situation.

Everything went as planned, and we taxied to take the runway at Bahrain International. I was on the controls in the lead aircraft. We transitioned to forward flight off the end of the runway, into the hazy darkness. As soon as I was clear of the departure-end numbers, I started an easy, right-hand climbing turn toward Copter Bravo (a VFR checkpoint) and prepared to knock out the health-indicator-test (HIT) checks.

From the moment we turned away from the runway, I felt like I was flying deeper and deeper into a vast black hole. It took only a few seconds for the well-lit

Bahraini shoreline to disappear into the haze and blend into the black nothingness. After we completed our HIT check and engaged altitude hold, I made what turned out to be my worst decision of the night: I glanced away from the gauges and peeked through my night-vision goggles. Within the two seconds that I had peered at the green scintillated world in front of me, I saw several lights. However, I couldn't figure out if they were stars poking through the haze or lights on the dhows floating in the Gulf.

It took only another two seconds before I was fighting airspeed, heading, and balanced flight all at the same time. When I realized what was happening, I confessed to my crew I had vertigo. The helicopter-aircraft commander (HAC) was “heads-down,” reading the HIT numbers from the checklist and couldn't take the controls when I asked. I didn't realize he still was heads-down and needed a few seconds to get focused on the gauges. I again asked him to take the controls but with an even greater sense of urgency in my tone of voice. I was terrified the aircraft was as out-of-control as it felt in my head and prayed he could look at the gauges and magically put in some control input to make it fly straight and level again.

I SHOULD HAVE CONFESSED what I was feeling to Dash 2 as well, instead of letting them wonder what was going on in our aircraft for the next minute or two. I tried desperately to recage myself by looking for outside references, then back to the gyro. Every time I glanced outside, the world seemed to spin more and more out of control. After a few minutes—that felt like hours—I managed to realign with the instruments. The HAC made sure I was good to go and passed the controls back to me, while letting Dash 2 know we were ready to continue.

I concentrated solely on flying the gauges for the next few minutes, letting the HAC make all the radio



*It took only another two seconds before I was fighting
airspeed, heading, and balanced flight all at the same time.*

calls. I felt as though I was back in control of the aircraft as we verified the aircraft performance numbers. As we entered a right turn to head toward our working area, the spinning returned to my head without any warning. I knew I was turning right and still holding altitude, but I couldn't shake the feeling that my helicopter was in a descending left turn, with increasing airspeed. As the wind rushed by, I knew I wasn't in balanced flight anymore.


"I'm messed up again; you gotta take the controls," I said, hoping the HAC still knew which way was up.

Not wanting to make the same mistake as earlier, we immediately radioed Dash 2 to let them know what was going on. We decided a couple of syllabus cards weren't worth both crews flying in these conditions. We made a 180-degree turn back toward Bahrain and dissolved the flight. My head continued to tell me the aircraft was spiraling out of control until I "recaged" myself off the bright lights of Bahrain shining through the haze. Both aircraft landed at Bahrain and shut down.

I took a few things away from the terrifying moments I had spent with my head spinning out of

control. We had admitted the weather and illumination conditions for the night were less than ideal, but our crew had wanted to at least get out there and give it a shot. We should have turned around the minute we realized we would not have a horizon, instead of flying outbound from Bahrain for a few more miles, hoping the conditions would improve.

When I got vertigo for the first time that night, I panicked when the HAC didn't take controls the instant I asked him. I knew altitude-hold was on, and the gyro was showing straight and level. Asking the HAC to take the controls in a less-than-calm voice could not have done much to instill confidence in my flying abilities.

I never should have looked through goggles in the first place. We weren't doing any TACFORM maneuvers, and even on a clear night, there isn't much to look at in the NAG. I was flying lead with good calls from our aircrewmembers to keep me updated on Dash 2's position. I had no good reason to leave the gauges and look under my night-vision goggles. 

LTJG. PHILLIPS FLIES WITH HSC-26.

Captains Jonathon Barr and Brian Silver were flying their AH-1W on a final predeployment training and familiarization flight at MCAS Camp Pendleton. As their last flight in CONUS was coming to an end, the crew decided to perform practice autorotations. As the aircraft commander, Capt. Barr flew the first one. After rolling both throttles to idle and getting established in the autorotation, he realized something wasn't right. He suspected the No. 1 engine had flamed out, but without a full set of engine instruments in the front seat, he couldn't be sure. Captain Silver cross-checked the gas-generator-turbine gauge in the rear seat to confirm the engine had flamed out.

Captain Barr continued the profile, turned to final, and returned the throttle of the No. 2 engine to full open. Unsure of what had caused the No. 1 engine flameout, they assumed the worst-case scenario and possible loss of the second engine. They maintained an auto-rotation profile and slid the aircraft onto the airfield's grass runway in a successful controlled single-engine approach. Maintenance determined the flameout was caused by a mechanical failure of the fuel-control system.



BRAVO Zulu



A P-3 crew from VX-20 at NAS Patuxent River, were conducting a sonobuoy test south of Key West, Fla. Shortly after arriving on-station, the aircraft commander rolled the aircraft into a left hand turn when the yoke broke free, resulting in a loss of aileron control. With the yoke freely spinning, he returned the aircraft to level flight using the rudder and elevator. Controls were passed to the copilot, whose yoke was operating. The crew surmised they had a broken interconnect chain between the yokes—a malfunction not addressed by NATOPS. They climbed to a safe altitude, did a controllability check, dumped fuel to reduce their weight, and landed at NAS Key West.

From left to right) AWF1 Frank Renjifo, AT2 Matt Rasmussen, AWF1 Bill Rhiley, Mr. Scott Van Fleet, Mr. Ron Hidde, Lt. Matt Lecher, and Mr. Lawrence Wells.

Not-So-Round Robin

BY MAJ. GREG MERK, USAF

A routine day in West Florida turned out to be a near miss with disaster. A simple instrument, gas and position (IGP) report made all the difference.

My student and I took off on what would be his last T-34C flight in primary flight training, a night-visual-navigation round robin from North Whiting Field to Panama City.

As a flight instructor with more than 5,000 flight hours, including 3,000 T-34C instructor hours, I have flown everything from helicopters to jets, and from supersonic bombers to props. I have (or should I say, had) yet to be surprised by anything a student or the Turbo Mentor could throw at me.

Takeoff was standard and uneventful. We headed down the beach, east bound, enjoying VFR conditions. As is my habit pattern, I maintained flight following with approach for the duration of the sortie, always preferring an extra set of eyes for the unexpected or unseen. We were 30 minutes into the flight when things changed.

IGP reports are graded on every sortie since day one, and for good reason. These reports generally are given by the student at least every 15 minutes, and any IP who doesn't constantly monitor his instruments will sooner or later wish they had, no exceptions.

While visually navigating down the beach, I checked the prop torque. It read 2,150 rpm; the limit is 2,200 +/-25. I checked the condition lever full forward, and asked my student if his gauge read the same. We no sooner compared instruments when the rpm began to steadily decrease. We just had passed Hurlburt AFB.

In the B-1B, you might throw a blade and lose an engine, which is no problem. You have three more F-16 engines to get you home, which is comforting. Flying in a single-engine T-34C and losing an engine is not so comforting.

I immediately declared an emergency and turned toward Hurlburt AFB for a precautionary-emergency landing (PEL). Approach gave us the handoff to tower, and the fire-rescue trucks began to roll. We pushed power to max, and got around 1,200 foot-pounds, which initially gave us 2,200 rpm on the prop. This rpm was short-lived however, as it once again gradually decreased, along with my, "seasoned instructor, seen it all, and nothing bothers me" comfort level. Before we touched down, the rpm had deteriorated below 1,900. Fortunately, we made it on the deck before the situation worsened.

Our maintainers found a failure of the primary-prop governor, sometimes caused by a shaft failure on the governor or metal particles in the oil system. This failure is a precursor to a chip light, which is very bad in a T-34C.

No practice, procedure or condition is too mundane. Had we not noticed the prop rpm in its "last rites" stage during that IGP, we may not have been in such a convenient position to make a PEL. A now more-seasoned aviator knows he's not immune to surprises. 🦅

MAJ. MERK, USAF, FLIES WITH VT-3.

Crew Resource Management

Decision Making

Assertiveness

Mission Analysis

Communication

Leadership

Adaptability/Flexibility

Situational Awareness



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WATER Sandwich

BY CAPT. WILL MOORE

Everyone in naval aviation understands the importance of nutrition, hydration, and a solid exercise program. Here's a true sea story which highlights the importance of a proper diet, factors that affect your ability to eat properly, and the importance of crew-resource management (CRM). This story applies to maintainers and aircrews.

I was the officer in charge during the closeout of a two CH-53E detachment supporting noncombatant evacuation operations in Sierra Leone, Africa. Operation Desert Storm was about to start, and the detachment aircraft and personnel were required back at home base in Sigonella, Sicily. After flying off USS *Nashville* (LPD 13) into Rota, Spain, the detachment was anxious to get back to home guard for some well-earned rest and relaxation. We knew the last leg of our journey would involve a long day: a 1,000-mile transit, carrying the entire detachment of 20 maintainers and two sets of aircrew. We all got a nice meal and then hit the rack for an early rise and go.

The next morning was a typical day in the Mediterranean. The mission was to fly a two CH-53E formation flight from Rota to Sigonella, with three fuel stops. This scenario was not uncommon in the squadron, and we thought we were ready.

All went well on the preflight, and the weather looked good. After take-off, we headed VFR to the Alicante airfield for gas. Our next stop was Palma De Majorca for another refueling; this leg was short and bypassing a fuel stop was not a good idea, given the long transit. We fueled in Palma. Both aircraft were performing well and no crew issues surfaced. Although I was getting hungry, I didn't tell anyone — lesson No. 1.

Our next fuel stop and planned food stop was Decimomonu in Sardinia, which was famous for its burgers. After we had arrived and fueled, we found out there wasn't any food to be had at the airfield.

We pressed on with the flight rather than seek nourishment off base, which would have involved a lengthy search. So, we took off from Deci and headed home on the last leg. Because of the long day, the last leg of the flight was at night, which was one more factor to consider. While flying about 75 miles from the western portion of Sicily, we encountered some unexpected clouds and dropped to stay VMC. While below the cloud layer, and really feeling energetic from my water-sandwich diet, I remembered there was an island just west of Trapani, which is on the western



portion of Sicily. At our present altitude, we would collide with its unlighted terrain, so we climbed to avoid any terra firma.

Next, we were faced with a low cloud layer extending across the entire landmass of Sicily. To avoid getting stuck in a valley in the middle of Sicily, we choose to work our way around the southern part of the island. At this point, no one was looking to log any more flight time.

I developed one of those eye aches, but being the typical caveman, I didn't tell anyone I felt a bit tired. We pressed on and once we got to Gela, we proceeded to the air station via the normal course rules of Gela to Caltigirone to Palagonia, and then to NAS Sigonella for an uneventful landing and aircraft shutdown.

We had completed our highly successful detachment, and after finishing our paperwork, headed upstairs in the squadron spaces. The CO met me and gave me a bottle of squadron wine, which was made for the holiday season. I thanked the CO, and went into the head because I felt ill. I was in no condition to drive the 30-minute drive home on the crazy Sicilian roads, and elected to sleep in the duty bunk room. After a good night's sleep and a solid breakfast the next morning, I felt much better.

Crew-resource management is not just for aircrews. If you are a passenger along for the ride and have not had adequate food or hydration, speak up—others are in the same situation. If you are not feeling 100 percent,

be a professional and tell another crew member. Maybe your proactive step will be all it takes to break the potential chain of events which could lead to a mishap.

We are not mind readers, and it is tough at times to be the one who calls uncle, but someone has to do it. Once called, others likely will open up and state they felt the same. No one wants to be labeled as the "Can't do person"; that's human nature.

When planning for a long mission, make sure you cover mission-essential items like food and hydration. Don't accept the status quo. Just because everyone has been operating a certain way for years does not necessarily make it right. Apply the concept, "professionals invite scrutiny" to your mission areas.

In this case, during post mission, the above issues were brought up to the safety department. The result was a new squadron policy directing a two-day transit for forward-deployed detachments returning to home guard. This policy would make sure other crews would not face the same situation. Also, remember that it is healthy for professional naval aviators to challenge the status quo. It enhances your ability to accomplish the mission.

Remember to use crew-resource management and time-critical risk management as your mission enablers. 🦅

CAPT. MOORE IS THE COMNAVAIRLANT SAFETY OFFICER, AND WAS A QUALITY ASSURANCE OFFICER AND DETACHMENT OFFICER IN CHARGE AT HC-4 DURING THE ABOVE STORY.



Into the Dark

BY LT. GRAYSON K. SIEG

“Suck a duck!” I left my oxygen mask in the plane,” I grimaced.

The ready-room chair shuddered from the swift kick of my boot.

Maybe I should just leave the damn thing in the back of the Hawkeye. No one would notice it, anyway. But my better half cringed in retort. It wasn’t the right thing to do, and I was unsure whether retrieving the mask was more altruistic or self-preservation. My name was on it. If the XO caught me, he’d tear me in two.

“Alright,” I sighed to no one in particular, “up I go.”

I grabbed a clean float coat from the pegboard in the PR shop and slipped it on. The ashen-green coat added a little needed anonymity. After a minute of fum-

bling with the cranial, I gave up and grabbed my flight helmet—so much for anonymity.

If you haven’t been to the Middle East, but I’m guessing you probably have, the region is a lot like the surface of the sun. Even at night, when you would think Mother Nature would take a break from heating the North Arabian Sea, the wind blows fierce, like a hair dryer in a sauna. I cautiously walked out into the darkness and the 30-knot gusts behind the tower. The moon was hidden behind low-hanging sheets of dust and sand. Stars were something you had forgotten months ago. The heavens were draped with nothing more than the pillowy effervescence of grime—beautiful.

The heavens were draped with nothing more than the pillowy effervescence of grime.

Only four months into cruise and the nonskid had the gripping power of a hockey rink. Oil and grease were caked in generous layers over the cracked asphalt. I was careful not to step into any yellow gear as I snaked my way around the tower, past the bomb farm. I stepped over coiled black hoses, unwound by purple people. The hoses resembled sleeping snakes.

I approached the E-2, which sat forlorn but safely isolated from the foul lines. "This should be a piece of cake," I thought, as I waved to the second class finishing the daily on the heavy warbird. I walked around the wingline and couldn't help but think something horribly was out of place. What was I forgetting? I stopped in my tracks. Float coat? Check. Head and hearing protection? Check. What was wrong here?

I shook my head and went forward into the dark. Flashlight? Damn.

The main entrance hatch of the aircraft was open. All I needed to do was jump in, get the mask, and get downstairs inside the skin of the ship, which offered ample lighting and air conditioning.

With a sickening lurch, I found myself going horizontal. A needling pain shot up my shin. I threw my hands out. The prop. Please don't be turning. Don't fall into the prop.

The prop wasn't turning; it was my head that was turning. With a smack, the cold metal of the door ladder hit my chin, then my shoulder. I fell on my back—too stunned to move. My mouth was numb. It was like I was eating tin foil and strawberries. My eyes watered. What was happening?

I felt hands on my chest, pulling.

"Are you OK?"

"Do I look OK? Where are we? Who am I?"

"Uh, sir ..."

"I'm screwing with you," I said, patting his cranial.

I spit some blood from my mouth. A dull ache, check that, a strong, nope, a severe, "Oh, mommy, it

really hurts" pain filled my mouth. Must have cut my tongue. Today is pizza day, too.

"What did I trip on?"

The petty officer shined his blue light on the wheel well. Sure enough, a low-lying chain was stretched only inches above the ground, its rusted shell glowing in eerie sapphire radiance. I scowled. I wanted to beat the crud out of that stupid chain, but figured I'd only hurt myself.

I happily accepted his hand and went inside to retrieve my prize. Of course, I couldn't find the darn thing.


Outside, three greenshirts happily stepped forward to set up a chain, a "safety chain," to keep me safe—the irony was not lost on me.

"What happened to the oxygen mask?" I asked, exiting the plane. I thought it was more of a rhetorical question, and I was surprised to get an answer.

"Oh yeah," said the second class, laughing, "That is what you are up here for?"

He started laughing again, to my noticeable chagrin, "We found it in the back after your flight. Fortunately, the XO was on the deck, so he volunteered to take it down for you."

Many important lessons were learned that day. First, my XO doesn't share the same quirky humor as mine. Second, FOD is an important issue. You always should sanitize yourself, your tools, and your flight gear before and after every evolution, whether it's an inspection, maintenance action, or flight. If something is missing, tell everyone who needs to know.

Finally, think through the safety equipment you will need before entering a dangerous environment. It was foolish to walk onto the flight deck at night without a flashlight. Even with the proper PPE, I found myself nursing a significant gash on the top of my tongue. The next time our safety officer speaks up in defense of assessing risks via our ORM toolkit, I will be the first and most vocal proponent. 

LT. SIEG FLIES WITH VAW-121.



Just Another Routine

BY LT. MIKE WILLIS

As a nugget, I hesitate to call combat operations routine. However, after flying more than 200 hours in support of Operation Enduring Freedom (OEF) within the previous five months, that's how I felt about what was to be my last combat flight of deployment.

I had the same brief, the same mission, and the same weapons loadout as my previous three dozen OEF missions. My lead briefed that, even though it was the last week of cruise, we would conduct our flight no differently than if it were the first week: Good headwork should prevail over "get-home-itis." Everything was standard: The weather was VFR, and two of our three scheduled tankers were KC-10s. It definitely was a good-deal flight.

We completed our preflight system checks, and my flight lead and I launched off the front end of USS

Theodore Roosevelt (CVN-71). We immediately joined up and flew north through the Arabian Sea. With all combat systems operating normally, lead called to tell the boat we were pushing. Our route, known as the "Boulevard," took us through Pakistan and into Afghanistan.

The transit up the Boulevard took a little more than an hour, which left plenty of time to monitor the health of our systems and to mentally rehearse our weapons-delivery procedures. Once feet dry, my lead and I completed checks of our advanced-targeting-forward-looking-infrared (ATFLIR) pods and our air-to-ground laser targeting/tracking systems. We practiced the system setup and data entry for joint-direct-attack-munitions (JDAM) deliveries.

Shortly after completing our checks, we reached



Flight

... absolutely nothing is calming about hearing, “Engine right, engine right,” while over Afghanistan, hundreds of miles from the boat.

the point where we had insufficient fuel to return to the carrier without refueling. Crossing this imaginary line in the sand always is significant; it has implications for how we handle unexpected events, such as emergencies or tanker losses.

When the Hornet has a serious malfunction, the aircraft warns the pilot with an automated female voice, which is supposed to have a calming effect. However, absolutely nothing is calming about hearing, “Engine right, engine right,” while

over Afghanistan, hundreds of miles from the boat. I looked down at my left digital-display indicator (DDI) to see what specific malfunction had triggered the aural warning. The DDI showed an R STALL caution. Per NATOPS for an engine stall, I brought the affected throttle to idle in an effort to clear the stall. Seeing the rpm fall well below the in-flight-idle limit, I concluded the stall had not cleared, and I secured the engine.

Suddenly, the flight was far from routine. My combat-loaded, and now single-engine, Hornet decelerated as I tried to maintain altitude. I told lead of the situation. He immediately coordinated a lower altitude with air-traffic control to be in thicker air, where single-engine performance is improved. Knowing we were too far from the boat to turn around, lead contacted our first tanker to coordinate a lower-altitude rendezvous and at slower-than-normal speeds. The plan was to tank and return to the ship for a single-engine recovery.

EN ROUTE TO THE TANKER, the plethora of engine-related cautions associated with an engine shutdown was accompanied by a flight-control-system (FCS) caution. I checked my FCS display and saw that my right leading-edge flap (LEF) was X'd out in both channels, suggesting that it no longer was receiving hydraulic pressure. The HYD 2 system (associated with the right motor) normally supplies hydraulic pressure to the right LEF. With the right motor secured, a switching valve should allow the HYD 1 system (associated with the left motor) to pick up the load, as pressure falls below 800 psi. A low-pressure sensor will secure the LEF if pressure remains low for more than 10 seconds. My right motor just happened to be windmilling at an rpm that produced about 1,000 psi in the HYD 2 system, causing the switching valve to cycle repeatedly. As a result, the LEF was secured. This phenomenon is described in NATOPS but still is disconcerting.

With nuisance FCS cautions added to the problem, and since Kandahar was only 100 miles away, my lead and I decided a divert was our best option. Because we already were nearly joined with the tanker, we got gas before diverting. Tanking on a KC-135, single-engine, turned out to be manageable, thanks to the lower altitudes and slower airspeeds. However, at 250 knots and below 20,000 feet, I still was in and out of afterburner to stay in the basket. Tanking at normal airspeeds and altitudes would not have been possible.

After topping off, we headed toward Kandahar. My lead previously had coordinated clearances with approach and tower, which reduced my communications with these agencies. We then stepped through the procedures for landing with a secured right engine. Because the HYD 2 system powers the landing-gear extension/retraction, brakes, nosewheel steering, and anti-skid, several things must be considered. We decided to windmill the right motor during gear extension. This action

temporarily powered the HYD 2 system to allow normal gear extension, preserving my emergency hydraulic accumulators for emergency brakes.

We also decided to windmill the motor on short final to allow the HYD 2 system to power the right LEF, thus avoiding a single-engine approach with a "FLAPS OFF" caution. Although windmilling an engine with a mechanical failure can cause further damage, I was more concerned with having my right LEF for landing and having emergency brakes available for rollout.

We discussed maintaining a minimum of 85 percent on the left engine to avoid any chance of a MECH reversion (an FCS backup mode in which the stabilator reverts to manual control without assistance of the flight-control computers). A MECH reversion can result in a pitch down and a potentially unrecoverable attitude on final approach. With the gear extended and the flaps working properly, my next concern was stopping on the runway. Our intent was to make an arrested landing, with emergency brakes as a backup in case of a hook skip.

My jet sat on runway centerline for more than two hours before the airfield located a tow bar.

About 20 miles south of Kandahar, I adjusted my gross weight by dumping fuel. Once at an acceptable NATOPS landing weight, I cranked the right motor to extend the landing gear and accepted vectors for a straight-in approach to runway 23. At an extended abeam position, approach directed me to contact tower and check in.

I called tower and said I was an emergency Hornet requiring a short-field arrestment. Tower asked if I wanted to take the barricade on runway 23. Puzzled by the question, I replied that I required the short-field gear, not the barricade. Apparently, my desire for the short-field gear was lost in the translation between approach and tower. Tower said the gear only was rigged on runway 05 and directed me to switch back to approach for vectors. The winds were light that day, so switching runways didn't present any tailwind or crosswind concerns. Within 10 minutes, I again was at a wide abeam position—this time for runway 05—and ready for the straight-in. Approach switched me back to tower, and I intercepted

an eight-mile final. Tower cleared me for a short-field arrestment on runway 05. Flying qualities on final were fine, but the jet felt underpowered, and I was careful not to pick up an excessive rate of descent.

I landed a few hundred feet short of the gear and kept the left engine at about 90 percent until I felt my hook catch the wire. A second later, I felt the relatively gentle tug of the land-based arresting gear and brought the left throttle to idle. After a short rollout, my jet came to a complete stop, and I breathed, perhaps prematurely, a sigh of relief. Welcome to Kandahar.


Although I was safe on deck, my ordeal was far from over. Kandahar hosts a wide variety of coalition aircraft but not the Hornet. With my right engine secured, I had no normal brakes or nosewheel steering and couldn't taxi clear of the runway. The only safe way to remove my aircraft from the centerline of Kandahar's only runway was with a tow.

Normally, towing an FA-18 is not a big deal. However, none of the crash crew at Kandahar ever had towed a Hornet. In fact, they could not locate a tow bar compatible with my aircraft. Anxious to get my jet clear of the runway, the airfield crew asked my permission to tie a strap to the nose strut and tow it with a truck. When it was clear of the runway, they would let the jet coast to a stop. "No way," I responded. They then asked if they could push the jet off the runway, but my response was the same. I explained several times that, with my right engine secured, the jet had no brakes (except emergency brakes) and no nose-wheel steering. The only way the aircraft was going anywhere was with a proper tow bar.

My jet sat on runway centerline for more than two hours before the airfield located a tow bar. The Marine Combat Element on base had a staff sergeant

who just happened to have been an FA-18 plane captain at one of his previous commands. He had a CH-53 tow bar he could rig to fit a Hornet. My aircraft finally was towed clear of the landing area, but not before tower had landed a C-130, an unmanned-aerial vehicle, and a twin-engine propeller plane over the top of my jet, which, by the way, was parked 2,000 feet from the approach end of the runway. Tower's decision to land aircraft over the top of mine definitely was not standard and had some obvious safety implications. However, the show had to go on, and I had no say in the matter.

In the end, what promised to have been a standard, routine flight turned out to be anything but. Fortunately, our brief had covered the contingencies we had. In addition, my flight lead had discussed crew coordination and the role it played in such contingencies. Even though we encountered a number of non-standard events, I felt well-prepared to deal with them.

The only issue we were unprepared for was the lack of an appropriate tow bar. While the importance of a clear runway at a major airfield during combat operations is obvious, a strap, truck, and coasting stop on a brakeless Hornet might not be the best method to achieve that goal. In the future, better coordination between divert fields in theater and the assets that use them may go a long way to making sure that basic support equipment is available and ready to use. Until then, don't count on anything being routine after touching down at an unfamiliar field. 

LT. WILLIS FLIES WITH VFA-87.

Mishap-Free Milestones

HMLA/T-303	220,000 hours	28 years
HSM-41	150,000 hours	27 years
VP-46	308,000 hours	46 years

LAMPS Bubbas— *Don't Get Shot At*



BY LT. TROY LEVERON

We had been on station for three days doing routine surveillance flights of two suspected pirated vessels: the Win Far and the Charelle. During the NATOPS and operational-risk-management (ORM) brief, we covered threats, primarily their several large-caliber rifles. I told the crew we needed to respect the threats. However, I sensed complacency already had set in, and I also was a victim.

The rules of engagement (ROE) had us maintain a non-threatening, deescalatory posture. We had our weapon (a .50 caliber machine gun) in the inboard stow position, with no ammunition in the loader box. On a flight the previous day, our missile-warning system had indicated a potential missile launch. The effect was two-fold. First, it brought the importance of defensive maneuvering to the forefront; I was spring-loaded to execute those maneuvers. Second, I briefed my crew that we would activate the flare

increased activity around the pilothouse and on the main deck directly below it.

We just had finished a right turn to north, past the ship's bow, to put the vessel's starboard side down our starboard side. The 20-knot southerly wind pushed me in as far as 0.3 miles when I completed the turn. I put in a small heading crab to regain our separation. As we came abeam the Win Far, I had reduced visibility on the vessel because it was now up-sun from me. The sun also hampered the crew-

After watching the tape, my OinC met us in the hangar and said we had definitely been fired on.

dispensers so they were accessible with the press of the switch on the cyclic.

We launched at 0600, 30 minutes after sunrise. Red Stinger 101 took up station circling Win Far at 0645. The initial surveillance plan composed of an orbit around Win Far, an orbit around Charelle, and lastly a check of the shoreline for skiffs on what we called skiff beach. Upon completion, we flew alternate orbits around both ships, with occasional surveillance along the shoreline. We noted early in the flight a surprising amount of suspected pirate (SP) activity on the Win Far.

I flew a .5 to 1.0 nautical-mile arc around the Win Far, based on our best known radar track. Previous flights by other pilots had all used this distance, and we briefed it to the chain of command that it was a good distance to get intel. I also flew right hand orbits, so the aircrewman and I could see any threats, weapons or unusual actions.

THE SUN WAS RISING IN THE EAST. To our tactical advantage, I used the up-sun approach. Several times, I pulled into a hover at 1.2 miles to allow the aircrewman to take better pictures. My airborne-tactical officer (ATO) worked the forward-looking-infrared radar (FLIR) to downlink imagery to the ship. After a hover to the east and south of the ship, we made several more orbits at 500 feet. I then asked the crewman and ATO if we should increase altitude to get a better look. They agreed the altitude increase would yield better intelligence on the cargo hold, where we suspected hostages were kept. I continued to orbit while they gathered more imagery. The ATO again commented about

man's vision, even though he was alternating looks through the camera and the binoculars. Then a series of events rapidly took place.

Simultaneously, the ATO (using FLIR) said it looked like someone had thrown something overboard. I heard the bridge-to-bridge (BTB) radio key with the sound of quick clicks. The internal-communication system (ICS) keyed momentarily. Then something occurred that sounded like the sensor-operator (SO) table dropping two to three times above and over my right shoulder. The commotion caused me to roll the aircraft left to increase my distance from the Win Far. From what I can recall, the cockpit conversation went something like this:

ATO: "I see black things, like they're throwing something overboard, like a spray of black."

BTB: Key, click, click, click, release.

ICS: Key, release.

Pilot: "What was that sound? Did you hear anything? Black things? You're up black hot, right?"

ATO: "Yes, black hot."

Pilot: "So, they where hot?"

ATO: "Yeah, so what if black is hot. SO, did you see what I saw on FLIR?"

SO: "No."

ATO: "Control, did you see anything?"

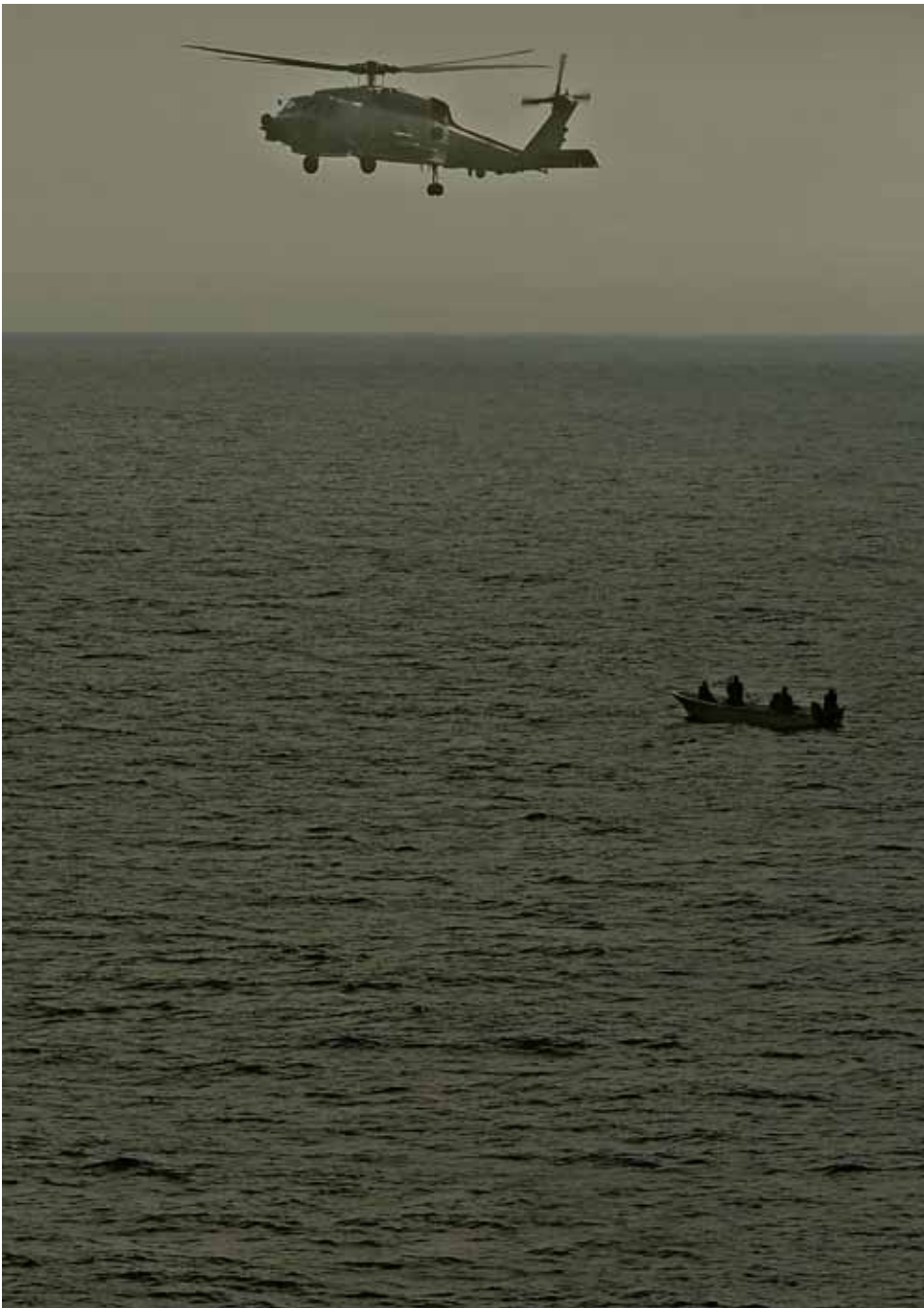
Control: "No, my head was down, but the guy next to me said he saw something."

Pilot: "SO, did you hear anything?"

SO: "Yes, it sounded like the rotors flapping in a turn."

Pilot: "Did you hear anything?"

ATO: "I thought I heard a pop, pop."



With an increased distance of one mile from Win Far, we continued the right hand orbit.

Pilot: "I heard BTB key with a click, and heard something above and right. Did anything move or fall in the cabin?"

SO: "It looks secure back here."

I started to feel my body temperature increase, and the hair stand up on the back of my neck.

Pilot: "Control, pilot, mark tape."

Within a minute, the tactical-action officer (TAO) came on the radio.

TAO: "Pilot, TAO, what's going on?"

Pilot: "I don't know. ATO is saying they sprayed something overboard. We heard noises around the aircraft and BTB keyed with clicks."

TAO: "What do you think happened?"

Pilot: "I'd rather not say what I think I am going to say."

TAO: "What?"

Pilot: "Are you on a headset or broadcasting this? Is it just you listening?"

TAO: "Headset."

Pilot: "Roger, good. I'm not sure, I'd rather not say, but, I think we just got shot at."

Several minutes went by and our officer in charge (OinC) came over the radio.

OinC: "What's going on?"

Pilot: "I'm not sure. We saw something go overboard and I heard loud noises. I told control to mark tape."

OinC: "OK, we're trying to look at it."

OinC: "Can you rewind the VHS tape and play it down HAWKLINK? What did you see?"

ATO: "Lots of activity on the pilot house and directly below it. Also, above the cargo

hold on the starboard side, where they keep the hostages. I saw black things going overboard, like a spray."

OinC: "How about your instruments, gauges and controllability?"

Pilot: "All normal."

OinC: "OK, setting flight quarters now."

We couldn't replay the video down HAWKLINK because of a bad connector. Several more minutes passed. We found out later that the digital-video recorder in combat had filled up its hard drive, and did not record the incident from FLIR. Fortunately, we had

a tape recording on the aircraft's antiquated VCR.

I looked out my mirror for any indications of damage, and told the aircrewman we were slowing for him to look outside for damage. I told him to specifically look for bullet holes. After he was finished, I cycled the controls to make sure I got normal responses from the aircraft.

I grew anxious on the flight back. My mind was focused on one thought about the situation, and I couldn't wait to get out and check my aircraft for evidence. Upon landing, the OinC told us to pull the VHS tape and bring it in for review. I tasked my SO to get the tape, while we completed landing checks. When I saw the chains secure, I got out of the aircraft. I was surprised to see three maintenance technicians enter the rotor arc and check for damage.

AFTER A LOOK AROUND THE AIRCRAFT, I met the OinC at the nose and we went into the hangar. I recapped the situation. We went to combat to see what was going on and check the plan for the day's remaining missions. To say there was a lot of activity would be an understatement. I saw a template for a Navy Blue situation report (SITREP) on the big screen, and heard a bridge announcement to gather in the Chief's mess, where the only operable VCR was located on the ship, for a review of the footage.

After shutdown, we didn't do the usual postflight water wash, however, every maintainer on the shift was on the aircraft as soon as the engines shut down. After watching the tape, my OinC met us in the hangar and said we had definitely been fired on. I felt angry at the pirates, but angrier at myself for not having better readied my crew. I wondered how I would be looked at and judged as a helicopter-aircraft commander (HAC) for letting my aircraft and crew be fired on and for not returning fire. I continued to wonder as the day was finished out with tape reviews, flight debriefs, and interviews with everyone from my OinC to an embarked NCIS special agent.

I learned several things from this incident:

Complacency. Even when we recognize it and brief ways to mitigate it, we still fall victim to it. I let my crew become complacent with the tactical situation and the threat. We had no previous knowledge of hostile intent, but we did not give the threat the respect it deserved. Fly every flight as if you will have to defend yourself. I'm not saying to fly normal surface-surveillance-and-control (SSC) flights identifying Group 3


merchant vessels with the .50 cal locked and loaded, just be ready to defend the aircraft for the one in a million chance the merchant poses a threat.

Rules of engagement (ROE). The ROE guidance required a non-threatening posture, which meant flying with weapons in inboard-stow position. As the HAC, I should have brought this guidance to the attention of my chain of command because the people we were flying against had weapons. We intentionally should not limit our response options. Conversely, even if we were ready to fire, I did not see the threat action and would not have felt comfortable giving the order based on the information I had at the time. In this situation, we had opened the threat when we pieced everything together, so the right of self-defense no longer applied. Also, we knew hostages were close to where the firing had occurred.

Defensive maneuvering. Be ready at any time. We should practice defensive maneuvering so it becomes second nature to defend the aircraft when someone yells, "Break right!" The previous day, I had received a faulty, but unexpected, missile warning and did not maneuver because of my altitude and location. I learned from that flight, and was more keyed to maneuver this time should something arise.

Aircraft survival equipment. We do not consider this gear much until we fly during the helicopter-aviation-readiness program. Our aircraft are not equipped with the best gear available, so what we do have should be in working order. Equipment should be tested and reported if it is not working. As pilots, we should be accustomed to turning it on, knowing how it works, and responding accordingly to its indications.

Responsibility. Every member of the crew has an important role to play. We use crew-resource management from the moment we start flight training. We take it onboard and practice it. This event illustrates the importance of each crewmember's role. So much depended on the ATO in this instance, and the ATO had the most situational awareness. Even the most junior pilot should know and feel their actions, words, and knowledge — or lack of — dictate the path of the flight. My ATO did an excellent job with the information she had. The HAC is not always in the best position to know exactly what is going on.

Now my crew, the detachment, and I know what it looks and sounds like to be fired on. 

LT. LEVERON FLIES WITH HSL-49.



The Transition—

An Ergonomically Sound Poseidon

BY LTJG. CHELSEA BRUNOEHLER

E*rgonomics is the study of people and their work, and efficient ergonomics involves adjusting one's work environment to better fit the needs of the people doing their jobs. For pilots, this discipline directly correlates to ease of scanning the flight-station instruments. The P-3 community will transition to the P-8, and ergonomics will be important for the aircrew.*

Our military began applying ergonomic principles during WWII, when pilot errors induced by complicated control panels caused casualties and mishaps. Studies revealed inconsistencies in pilot control panels in various aircraft added significant time to the pilot's scan. This confusion distracted them from the tasks at hand. In an everyday environment, a few seconds may not make much difference, but in combat, a few seconds can be critical—or fatal!

The longevity of the P-3's mission and production has resulted in upgrades that have affected the integrity of the flight station by moving various instrument gauges. The original P-3 was derived from the Lockheed L188 Electra, a successful airliner throughout the 1950s. It entered the Navy's inventory designated as a P3V in July 1962. Fifty years, one designation change (PV3 to P-3), three major model changes (P-3A, P-3B, P-3C), and multiple upgrades later, the P-3 remains a valuable asset. The current inventory consists of five different configurations of the P3C: the Update II.5, Update III, BMUP, BMUP+, and AIP. Some aircraft incorporate CIP (communications improvement program), a modification which allows all radio operations to be controlled through the GPS display unit (CDU-7000), while other AIP aircraft incorporate a CNS/ATM (communication navigation surveillance/air traffic management) upgrade, which allows even more communication and navigational devices to be controlled through the GPS display unit.


WHAT ALL OF THESE UPGRADES REALLY ADD UP to for your average P-3 pilot is spending the first hour of each flight adjusting to a different flight-station scan. Though the variations are subtle, the aviator must recognize that the flap indicator is now where the AOA gauge was, the airspeed indicator is on the left of the attitude indicator versus the right, and certain radios may have to be manually operated at their box instead of at the GPS display. A pilot also may need to transition from the EFDI and EHSD (digital attitude and compass display) back to analog gauges. To the untrained eye, these differences may seem minor. But, on-station at 200 feet, no pilot wants to mistake their airspeed indicator for their altimeter, and spend the extra three seconds looking for it while their vertical-speed indicator dips into a 500-foot-per-minute descent.

These changes not only affect the flight station but also the crew's mission effectiveness. With each upgrade, many modifications have been made to the stations used by the navigator, tactical coordina-

tor, and sensor operator. The selection and tuning of radios changes from aircraft to aircraft on the three most recent updates, and on the BMUP+ model, the internal-communication system requires an entirely different method of radio selection. Weapons selection and target-tracking hardware among these aircraft are also different, so much so that even when operating on two AIP aircraft, panels may be located in different positions. The reality of the situation is that a new P-3 navigator could complete all of their training on an AIP aircraft, but on their first actual prosecution of a submarine, find themselves searching for the equipment and switches they need because they're flying an Update III variant.

During the last eight years fighting the Global War on Terror, the P-3 Orion has operated in several hostile environments, providing battlespace surveillance to ground commanders. Though motivated crews are eager to provide this assistance, these flights are well outside the P-3's original intended design and open-ocean mission. There can be no question of the importance of efficient ergonomics and station familiarity in this combat situation, especially in a high-threat environment during the taking off and landing phases of flight.

Repetition generally makes people good at their jobs, and muscle memory is a huge contributor to the efficiency level at which the military operates. It would be an easy solution to upgrade all aircraft to the most advanced model, but money and mission necessity dictate otherwise. Most squadrons today have some mission-capable aircraft, and also have some training aircraft, which are used more for pilot airwork, navigation, aircraft systems training, and practice landings.

Though our aging platform is reaching its twilight tour, there is much hope for the P-3 combat aircrews. The P-8 Poseidon is projected to reach the fleet by 2013 and has potential to be the Navy's new standard for user-friendly aircraft, with standardized flight and crew stations. It will encompass all of the upgrades during the P-3s half-century life span, and serve as the modern day, long range, maritime-patrol aircraft. In the meantime, P-3 crews will continue to practice reliable scan patterns, taught in the early days of flight school, to keep operating the venerable Orion out to 2019 or beyond. 

LTJG. BRUNOEHLER FLIES WITH VP-45.

HF Wire, Departing

While flying a standard mission in the USSOUTHCOM area of responsibility, an aircrewman in the galley of an EP-3 noticed the HF wire antenna hanging outside the window.

BY LTJG. MATTHEW S. CLIFFORD

The aircraft is equipped with two “dogleg” HF antennas that connect to the aircraft at the top of the vertical stabilizer, the outer edge of the horizontal stabilizer, and the empennage. Installed under tension, the antennas are designed in such a way that if one end separates, the other end also should separate, preventing a disconnected antenna from damaging the aircraft.

However, that safety feature did not work on this flight. The HF-2 antenna on the starboard side separated at the vertical stabilizer, then departed from the empennage and wrapped around the horizontal stabilizer. The wire became wedged between the elevator and the horizontal stabilizer, posing a controllability concern.

The electronic-warfare pilot (2P) and copilot (3P) were at the flight controls when the antenna separated. They didn’t feel any change in flight characteristics or binding controls, though. The flight-station crew completed the NATOPS procedures for an antenna separation and did a seat swap to put the electronic-warfare aircraft commander (EWAC) in the pilot’s seat. Having never experienced this emergency, the crew contacted the EP-3 liaison officer (LNO) at the combined air-operations center and the detachment officer in charge (OinC) to get backup from senior pilots and instructors.

We did a slow flight-controllability check to make sure the aircraft still was controllable at low speeds in the landing configuration. The flight-station crew discussed minimal elevator use during approach and landing to reduce the chance of a binding control. This discussion included the selection of approach flaps (rather than full flaps) for landing, to minimize the change in longitudinal pitch and required elevator control.

After all the briefs were completed, the crew was ready for landing. The off-duty flight engineer donned a headset and relocated to the starboard galley window to monitor the control surface and HF wire for any other abnormali-



ties resulting from controllability checks and landing. After the EWAC made an approach-flap landing, the aircraft was inspected, repaired and returned to service.

Leadership, situational awareness, communication, and adaptability are some of the skills of crew-resource management (CRM) we used. Not only were these skills demonstrated by the aircrew but by the entire squadron. Although located in three separate time zones, they came together for this evolution. As technology evolves and communication paths increase, the feeling of being alone lessens. CRM is not just confined to the flight station; it means using all available resources. 🦅

LTJG. CLIFFORD FLIES WITH VQ-2.

The Five Wet Flameout

BY LCDR. MIKE KINTER

Only a month into cruise, things couldn't have been going any better until that morning I was awakened by the glorious sound of "no loads" mere feet above my rack. The dog machine in wardroom three was out of commission, and the surface-warfare officers were in full effect with the 0800 general quarters. We were operating in our airwing's backyard, the Western Pacific, sharpening our skills by bombing targets into

would have a gut-check for an entirely different reason.

I strapped into 211 and manned-up for the event five primary tanker. For those of you who have not had the privilege of flying a five wet rhino off the pointy end, it consists of packing your helmet bag with two magazines, carrying along at least one Diet Coke, and making sure the aircraft has 29,000 pounds of JP-5. I launched with my fuel and helmet bag of goodies into the night and returned overhead for my "package

check." I checked sweet and remained overhead mom until the recovery was complete.

The recovery went as fragged. I checked out with departure and climbed to conserve fuel for the next recovery. Upon reaching 26,000 feet, I engaged the autopilot and settled into the long painful hour of max conserve. I was about to dig into my helmet bag and start reading about how Manny Ramirez had saved the Dodgers organization, when I noticed I

already was a couple hundred pounds below ladder. This fuel state was odd because I hadn't given all of my scheduled frag. I should have had plenty of fuel remaining for the next recovery.

I investigated a little further and realized my port engine was burning at a significantly higher rate than my starboard engine. I waited another couple minutes and recalculated my ladder to see if it was just a bad indication,



oblivion. We would be ready if the time ever came for us to do something that required our interdiction.

At supper that evening, as I doused my chili mac in Texas Pete, I focused on my next hop and thought, "Primary-recovery tanker, what could go wrong?"

As I walked to aircraft 211 later that night, I felt a sudden twist in my stomach and cursed myself for using so much Texas Pete at dinner. Little did I know that I soon

or if my port engine was burning more fuel. Minutes later, I had the same problem but worse. I was 1,000 pounds below ladder and getting lower by the minute. I immediately thought I might have a fuel leak. My stomach started to churn as I called the rhino rep to discuss the issue.

DID I FAIL TO MENTION that it was scary dark, no moon, with thunderstorms overhead mother? Standard conditions. The rep and I agreed that I should consolidate all my fuel with the secondary tanker and land early on the next recovery. I had coordinated earlier with the secondary tanker to get a visual inspection and consolidate fuel. As the secondary tanker plugged into the basket, he immediately reported a significant amount of fuel venting or leaking from the port engine casing. We knocked off the tanking, pointed toward mother, reported a fuel leak in my port engine, and that I would need a pull forward.

My mind was racing as I started thinking about all the bad things that could go wrong on this routine tanking hop. I should have opened the PCL to the “Fuselage Fuel Leak” procedure and worked through the steps. Instead, all I thought about was getting the jet on deck and talking with the rhino rep to get me a pull forward. The rhino rep coordinated for me to recover, and as I checked in with approach, I got immediate vectors for recovery. At eight miles and 1,200 feet, I was given the standard dirty-up call, and I proceeded with my landing checks.

As I placed the landing-gear handle down, flap switch to full, and slowed to on-speed, I immediately was greeted by the glorious voice of “Bitching Betty,” with words that I only had heard in the simulator: “Engine left! Engine left!”

I felt the airplane decelerate and yaw to the left and immediately went to afterburner on the starboard engine. After I had thrown out a few choice words, I immediately told approach, “211 is single-engine at six miles.”

I configured the aircraft to half flaps and started talking to the rep on aux radio. I told him I was going to keep it coming and land the aircraft, because I had no idea of the extent of the fuel leak and wanted to get the plane on deck. He offered some soothing words, “Take a deep breath, calm down, and bring it aboard!”


I was amazed how much power was required to keep a five wet on-speed at max trap. Coming down the chute, I was riding the military stop, promising I never again would miss another day of church. I settled into the 2-wire and came to a stop, only to receive three “lights on deck” calls before I came out of my mini-coma and shut them off. After landing, I smelled fuel and shut down the starboard engine.

The QA investigation found that a gasket the size of a silver dollar had failed in the port engine’s fuel-control unit, which caused fuel to stream out of the engine casing.

Once the aircraft was put in the dirty configuration, the fuel-flow requirements had become more than the faulty gasket could provide. The engine eventually shut down from fuel starvation.

I should have gone through the “Fuselage Fuel Leak” procedure in the PCL while I coordinated with the rhino rep. The procedure calls for the leaking engine to be shut down, and the fire light of the affected engine of the side where the leak was confirmed to be pushed. The secondary tanker confirmed the port side was indeed leaking-venting, and shutting down the engine would have allowed time to configure for a single-engine landing, instead of flaming out the engine on short final. If the leak had stopped, then I would have needed to land as soon as practical, and I would not have needed immediate vectors to final.

Single-seat pilots can employ good CRM. Use your rep and work through the problem as a team. At the time, neither of us thought about breaking out the checklist and working through the problem airborne. All we were concerned with was the jet leaking fuel and the need to get on deck as soon as possible. By working through the procedure, a flameout on short final could have been prevented, and I could have been more prepared for a single-engine approach to the ship.

You don’t need to be a test pilot when there are procedures in place to keep you safe. Strive to think about scenarios that could occur and how you would handle them as the aircraft commander. The only thing that is going to save you in these intense situations is NATOPS knowledge and procedures. 

LCDR. KINTER FLIES WITH VFA-27.



Same Emergency, *Second Time Around*

BY LTJG. TIM SHILLING

I was six months out of the EA-6B fleet replacement squadron (FRS) and had not yet experienced a “bold face” emergency in the Prowler. The first two emergencies that I did experience were nearly identical, and would happen one week apart under very similar circumstances. The only major difference between the two emergencies would be the successful application of lessons learned.

Our squadron was starting field carrier landing practices (FCLPs), and had planned on conducting the first set of night events. Because of a number of factors, including flight hour program-reduction challenges, our night currency had lapsed a bit. I had not flown in darkness in the last seven months. Our brief was standard, and we discussed the ORM concerns of night flying. Our plan was to head to a local working area and get reacclimated to the night environment before returning to base for a handful of automatic carrier landing system (ACLS) approaches.

After having read several articles on hearing loss, I had decided to wear in-ear hearing protection in addition to my helmet, as many of my fellow aviators do. As soon as the jet was up and running, I realized the ear plugs were not going to work for me. I turned the radios all the way up, and I still felt that they needed

to be louder. Although I could hear everyone fine on the radios and ICS, everything was much quieter than I was accustomed to. Nevertheless, I decided to continue with the ear plugs, thinking I would become more comfortable with them. On climb-out, I felt less connected to the jet, as I could not hear the engine response as well as normal. The lack of the constant drone of engine noise left me feeling as if they were offline. It was uncomfortable for everything to sound so different, and I decided to not fly again with these ear plugs.

During the flight, I slowly turned down the cockpit lights as my eyes adjusted. Without realizing it, I turned down some of the lights located near several important switches too dim to see, as I had been more concerned with my flight-instrument illumination and seeing the IFLOLS lens during my approaches.

The flight in the working area was uneventful. We returned to base and commenced our first approach. We were heavy and knew we would only do a low approach on our first pass. As I brought the throttles to MRT and the speedbrakes in for climb-out, the left engine temp light illuminated brightly. Climbing away from the deck, I announced to the crew in the most unemotional voice “We have a left engine temp light.”

I did the first parts of our bold-face procedure as we climbed away. The gang-bar came off, which secured

the left and right engine bleed air. Passing through 500 feet the left engine throttle was secured and we turned downwind. I barely could hear the remaining engine because of the ear plugs; a very uncomfortable feeling so close to the ground at night. Subsequently, my scan slowed as I concentrated on my engine and flight instruments, reassuring myself the remaining engine was healthy and we were climbing.

ECMO 1 (seated to my right) started talking to tower. The radio had so much chatter that I couldn’t tell who was talking and who was saying what. I climbed and got established on downwind. I reached down to secure the left engine fuel-master (EFM) switch, located adjacent to the right EFM switch. I looked down to confirm I had the correct switch. My lights were so low and the lights around the airfield were so bright that I couldn’t see the switch. If I secured the wrong one, my one good engine would flameout, resulting in a low altitude ejection. I tried to talk to my ECMO, but couldn’t get a word in over all the radio chatter. I decided to wait until we could have two-way confirmation that I had the correct switch before I removed my hand. The last step, to discharge Halon fire suppressant, would have to wait until the EFM switch was secured.

As I started my approach turn, the radio chatter diminished. ECMO 1, having seen my attempts,



reached down and secured the left EFM switch. I rolled in on the ball and flew it to touchdown. The short-field gear was de-rigged, so we planned to take the long-field gear if needed. As soon as the aircraft touched down the left engine temp light went out.

I said over ICS, "The light is out and I have not pressed the light." This action would have discharged the Halon.

No one responded. We pulled off on the high-speed taxiway, brought the jet to a stop, and got out to meet the crash and salvage crew. The crash-crew chief asked if I had discharged the Halon bottle (by pressing the engine fire light). I replied that I hadn't, to the surprise of my crew. They had heard, "The light is out and I have pressed the light."

OUR DEBRIEF WAS LONG AND THOROUGH, as we discussed what we did right and what we could have done better. A good chunk of the time was spent analyzing what had gone poorly with our CRM. After the debrief, we returned to maintenance control and found out what had triggered the light. The engine-temp sensor, which is triggered when the wire melts and the voltage it carries is interrupted, had become stripped and shorted to the metal chassis of the engine, causing the light to illuminate.

The night ended with everyone on deck and the jet intact, but my ego had definitely been bruised, as there were plenty of things I could have done differently. As with many situations, the contributing factors added up to what could have resulted in a mishap. To begin with, the lack of recent night-flight experience immediately set me behind the power curve. Then, I decided my first night flight in seven months would also be my first flight using the extra hearing protection. These two factors contributed greatly to my subsequent uneasiness and confusion. My visual cues were diminished by the nighttime environment, and my audio cues were changed drastically by the ear plugs. My two most used senses for flying were now severely diminished. This situation required me to slow my scan and spend more time on just flying, rather than dealing with the emergency.

We also identified several faults in our crew-resource management (CRM). When the temp light came on, we went too quickly to communicating with the outside world: inviting others into our cockpit. This delayed crew coordination. ECMO 1 could not see that I had become overloaded and required assistance in completing the immediate-action items. We should have waited to talk to others outside the aircraft. We

also should have extended upwind and taken care of the immediate-action items before turning downwind. We had gotten excited and tried to deal with things too quickly. Slowing down and applying CRM would have facilitated better results.

The very next week, we continued flying FCLPs and were up for another night period in the same jet. This time things went right, and it all started with a good brief. I briefed that even though the previous temp light had been erroneous, we would still honor it if it came on. We would also handle the emergency as a crew before talking with anyone outside of the aircraft.

I put on my flight gear, leaving the extra hearing protection on the table. I felt better that I was walking in the same gear I had always flown with. In the cockpit, I adjusted my lights as I had before, then turned them up an extra notch and pointed my canopy lights into the darker areas, including the left and right engine fuel master-switch panel that had been so hard to see a week earlier.

Once airborne, we got established on downwind and prepped for our first approach. Then, as before, the left engine-temp light illuminated. I announced it to the crew and shortly thereafter the light went out. ECMO 1 and I paused for a second, processing the fact that the light went out. We decided to follow what we had briefed and honor the light. Quickly, the gang-bar came off and the left engine throttle was secured. I reached down to the left engine fuel-master switch, which was well illuminated this time, and with the confirmation of ECMO 1, moved it to the off position. With a press of the left engine-fire light, I discharged the Halon and announced the procedures that I had completed to the crew. Only at this point, when the immediate emergency-action items had been completed, that ECMO 1 started talking to approach, and I turned in toward the field. We landed, stopped the jet on the high-speed taxiway and egressed as before to wait in the grass for the emergency vehicles to arrive.

I was proud of our crew and myself for executing the procedures correctly, and using CRM to the best possible outcome. More importantly, we did exactly what we briefed. I was oddly thankful for the immediate chance to redeem myself and use the lessons we had painfully learned the week prior. This time we handled everything as a crew and only when we were comfortable that the immediate-action items had been completed did we turn our attention to getting on deck. 🦅

"Not all mishaps occur in the plane."



"The things we do off duty can affect mission readiness as much as our actions in the aircraft."

—LCdr. Brad Sparks, VAW-77